

# Barnstable County Retirement System

Actuarial Valuation and Review as of  
January 1, 2014





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May 27, 2014

*Retirement Board  
Barnstable County Retirement System  
750 Attucks Lane  
Hyannis, MA 02601*

*Dear Board Members:*

*We are pleased to submit this Actuarial Valuation and Review as of January 1, 2014. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2015 and later years and analyzes the preceding two years' experience.*

*This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the staff of the Barnstable County Retirement System. That assistance is gratefully acknowledged.*

*The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.*

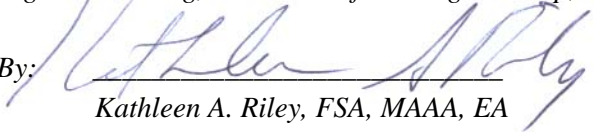
*The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in my opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.*

*We look forward to reviewing this report at your next meeting and to answering any questions.*

*Sincerely,*

*Segal Consulting, a Member of The Segal Group, Inc.*

By:



*Kathleen A. Riley, FSA, MAAA, EA*  
*Senior Vice President and Actuary*

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## SECTION 1: Valuation Summary for the Barnstable County Retirement System

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### Purpose

This report has been prepared by Segal Consulting to present a valuation of the Barnstable County Retirement System as of January 1, 2014. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of M.G.L. Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of January 1, 2014;
- The assets of the Plan as of December 31, 2013;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

### Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

1. The actuarial valuation report as of January 1, 2014 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected.
2. The actuarial value of assets as of December 31, 2013 was \$777.0 million, or 97.9% of the market value of assets of \$794.0 million (as reported in the Annual Statement). As of December 31, 2011, the actuarial value of assets was 109.6% of market value. During the plan years ended December 31, 2012 and December 31, 2013, the market value rates of return were 13.34% and 14.58%, respectively. Because the actuarial value of assets gradually recognizes market value fluctuations, the actuarial rates of return for the plan years ended December 31, 2012 and December 31, 2013 were 7.00% and 8.47%, respectively.
3. As indicated in Section 2, Subsection B of this report, the total unrecognized investment gain as of December 31, 2013 was \$17.0 million. This investment gain will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment losses derived from future experience. This implies that earning the assumed rate of investment return of 7.75% per year (net of expenses) on a market value basis will result in investment gains on the actuarial value of assets in the next few years. The funding schedules shown in Section 2, Charts 16 through 19 reflect the deferred investment gains in accordance with the asset valuation method adopted by the Board.

## SECTION 1: Valuation Summary for the Barnstable County Retirement System

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4. This valuation reflects the following changes in actuarial assumptions and method:
- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
  - The investment return assumption was decreased from 7.875% to 7.75%.
  - The assumed rates of salary increases were revised to more accurately reflect recent experience and future expectations.
  - The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally using Scale AA from 2010.
  - The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale AA from 2010.
  - The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally using Scale AA from 2010.
  - The assumed retirement age for inactive vested participants was changed from age 65 to age 55 for Group 1 and 2 members hired prior to April 2, 2012.

The changes in assumptions and method increased the unfunded liability by \$34.0 million and decreased the normal cost by \$1.6 million.

5. The following plan changes are included in this valuation:
- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$15,000 as of July 1, 2013.
  - Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.
  - As permitted by Section 63 of Chapter 139 of the Acts of 2012, the Board has increased the Section 101 annual allowance from \$9,000 to \$12,000.

## SECTION 1: Valuation Summary for the Barnstable County Retirement System

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- As permitted by Section 29 of Chapter 176 of the Acts of 2011, the Board has increased the Section 12 monthly allowance from \$250 to \$500.

The plan changes increased the unfunded liability by \$6.2 million and the normal cost by \$191,000.

6. The unfunded liability was expected to increase from \$522.4 million as of January 1, 2012 to \$534.4 million as of January 1, 2014. The actual unfunded liability as of January 1, 2014 was \$576.8 million. The greater than expected increase was due to the changes in actuarial assumptions and method, the plan changes, and a net experience loss.
7. With the prior valuation, the Board approved a funding schedule that fully funds the System by June 30, 2038, with a two-year phase-in (the appropriation increased 6% per year from fiscal 2013 through fiscal 2015). Chart 16 of Section 2 assumes the Board adopts increases to the retiree Cost of Living Adjustment (COLA) base from \$15,000 to \$16,000 as of July 1, 2015, then to \$17,000 as of July 1, 2016 and to \$18,000 as of July 1, 2017. Chart 16 shows a funding schedule that fully funds the unfunded actuarial accrued liability by June 30, 2036 based on an 8-year level amortization of the 2010 ERI and a 22-year increasing amortization (4.0% per year) of the remaining unfunded liability.

Charts 17 and 18 are based on the same COLA base increases described above. Chart 17 shows a funding schedule that fully funds the System by June 30, 2037 with two 4.0% increases to the total appropriation from fiscal 2015 to fiscal 2017, followed by a 20-year increasing amortization (4.0% per year) of the remaining unfunded liability. Chart 18 shows a funding schedule that fully funds the System by June 30, 2035 with four 5.0% increases to the total appropriation from fiscal 2015 to fiscal 2019, followed by a 16-year increasing amortization (4.0% per year) of the remaining unfunded liability.

Chart 19 assumes the Board adopts only an increase to the COLA base from \$15,000 to \$16,000 as of July 1, 2015. It shows a funding schedule that fully funds the System by June 30, 2036 based on a 22-year increasing amortization (4.0% per year) of the remaining unfunded liability.

8. The liability of the retired county sheriffs was recalculated to reflect changes to assumptions and plan provisions. Since the fiscal 2015 payment was already been budgeted at \$1,085,077, this recalculation is first recognized in fiscal 2016. Chart 16 of Section 2 shows a fiscal 2016 payment of \$1,306,971. This amount could change depending on the funding schedule adopted by the Board, as shown in Charts 17 through 19.

## **SECTION 1: Valuation Summary for the Barnstable County Retirement System**

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9. On a market value basis, the funded ratio has increased from 50.62% as of January 1, 2012 to 58.65% as of January 1, 2014. On an actuarial basis, the funded ratio has increased from 55.48% as of January 1, 2012 to 57.39% as of January 1, 2014.
10. Section 4 includes the disclosure information required by Governmental Accounting Standards Board (GASB) Statements No. 25 and 27. Section 5 shows the format of the disclosure information required by GASB Statements No. 67 and 68. The exhibits in Section 5 will be completed at the end of the year when December 31, 2014 financial information is available. At that time, the liabilities will be projected to the end of the year and the allocations to each employer will be determined.



## SECTION 1: Valuation Summary for the Barnstable County Retirement System

### Summary of Key Valuation Results

	2014	2012
<b>Contributions for fiscal year beginning July 1:</b>		
Recommended for fiscal 2015 and 2013	\$52,473,575*	\$46,702,087
Recommended for fiscal 2016 and 2014	54,576,015**	49,504,212
Recommended for fiscal 2017 and 2015	57,301,467**	52,474,465*
<b>Funding elements for plan year beginning January 1:</b>		
Normal cost, including administrative expenses	\$36,478,892	\$35,848,414
Market value of assets (MVA)	793,984,292	593,968,860
Actuarial value of assets (AVA)	776,973,700	651,063,981
Actuarial accrued liability	1,353,810,101	1,173,483,848
Unfunded actuarial accrued liability	576,836,401	522,419,867
Funded ratio based on the MVA	58.65%	50.62%
Funded ratio based on the AVA	57.39%	55.48%
<b>Demographic data for plan year beginning January 1:</b>		
Number of retired participants and beneficiaries	2,729	2,556
Number of inactive participants entitled to a return of their employee contributions	513	526
Number of inactive participants with a vested right to a deferred or immediate benefit	138	111
Number of active participants	4,696	4,670
Total payroll	\$243,205,954	\$227,741,789
Average payroll	51,790	48,767

\* Fiscal 2015 appropriation was restated to reflect full funding of the Nantucket Retired Sheriffs' liability.

\*\* Based on funding schedule shown in Chart 16 of Section 2.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### A. PARTICIPANT DATA

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A and B.

*A historical perspective of how the participant population has changed over the past ten valuations can be seen in this chart.*

#### CHART 1

##### Participant Population: 1997 – 2013

Year Ended December 31	Active Participants	Inactive Participants	Retired Participants and Beneficiaries	Ratio of Non-Actives to Actives
1997	4,229	501	1,730	0.53
1999	4,713	664	1,816	0.53
2001	4,970	899	1,952	0.57
2003	5,031	834	2,125	0.59
2005	5,269	765	2,201	0.56
2006	5,314	787	2,267	0.57
2008	5,290	748	2,368	0.59
2009	4,786*	772	2,422	0.67
2011	4,670	637	2,556	0.68
2013	4,696	651	2,729	0.72

\* Reflects transfer of county sheriffs to the State Retirement System.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### Active Participants

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 4,696 active participants with an average age of 48.9, average years of service of 12.2 years and average payroll of \$51,790. The 4,670 active participants in the prior valuation had an average age of 48.8, average service of 11.9 years and average payroll of \$48,767.

Among the active participants, there was one participant with unknown age. The actuarial calculations were adjusted for the missing information by assuming that it was the same as information provided for other active participants with similar known characteristics.

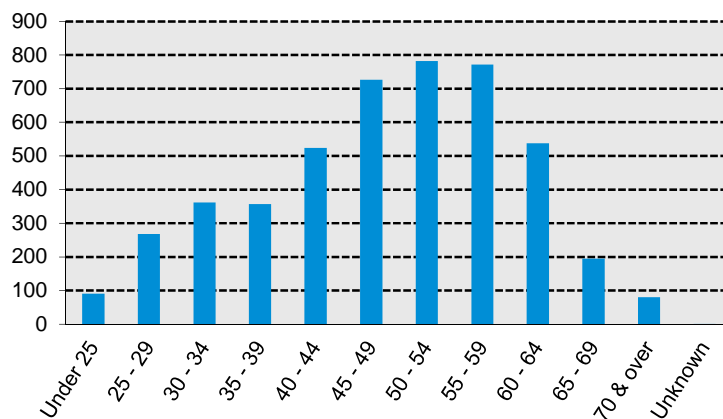
### Inactive Participants

In this year's valuation, there were 138 participants with a vested right to a deferred or immediate vested benefit and 513 participants entitled to a return of their employee contributions.

*These graphs show a distribution of active participants by age and by years of service.*

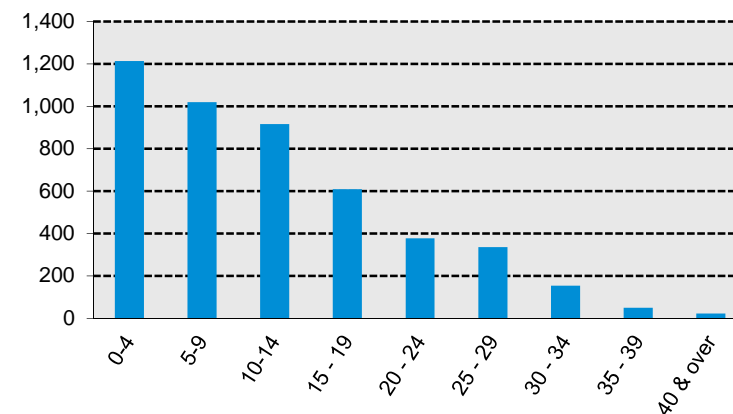
**CHART 2**

**Distribution of Active Participants by Age as of December 31, 2013**



**CHART 3**

**Distribution of Active Participants by Years of Service as of December 31, 2013**



## SECTION 2: Valuation Results for the Barnstable County Retirement System

### Retired Participants and Beneficiaries

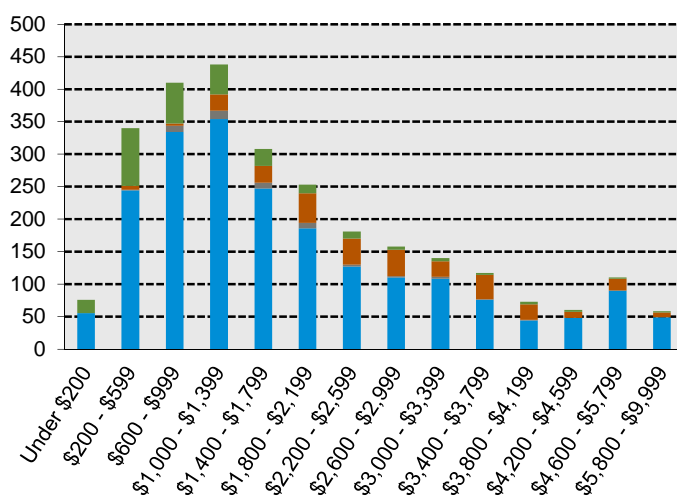
As of December 31, 2013, 2,429 retired participants and 293 beneficiaries were receiving total monthly benefits of \$5,255,178, excluding COLAs reimbursed by the Commonwealth. For comparison, in the previous valuation, there were 2,265 retired participants and 282 beneficiaries receiving monthly benefits of \$4,524,146, excluding COLAs reimbursed by the Commonwealth. There were seven retired participants in suspended status this year and nine retired participants in the prior valuation.

*These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.*

■ Beneficiaries  
■ Accidental Disability  
■ Ordinary Disability  
■ Superannuation

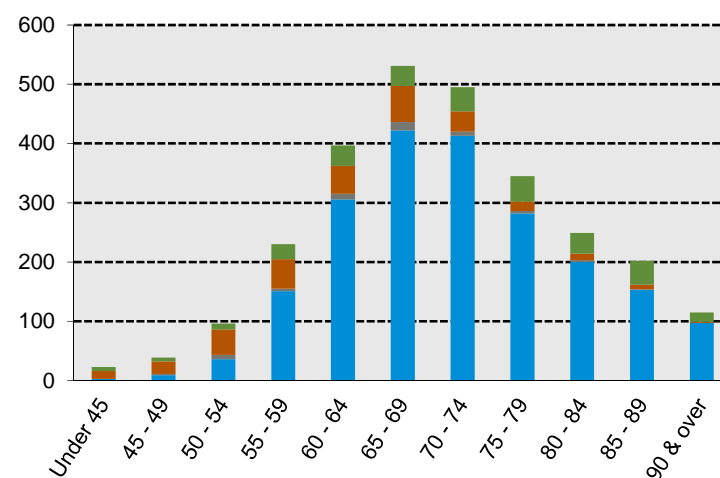
**CHART 4**

**Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2013**



**CHART 5**

**Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2013**



## SECTION 2: Valuation Results for the Barnstable County Retirement System

### B. FINANCIAL INFORMATION

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

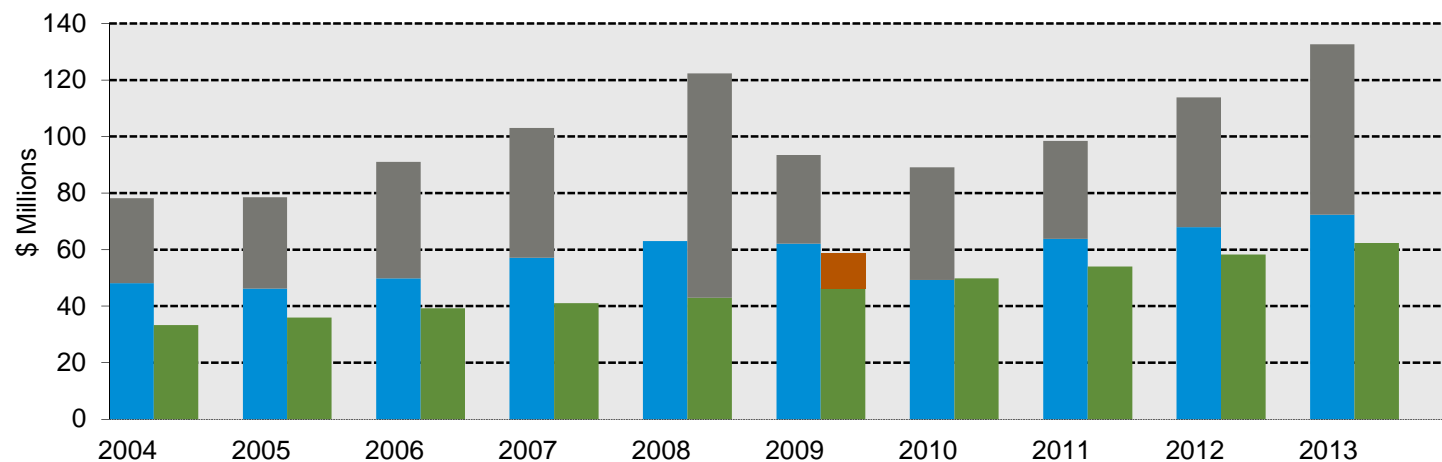
Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits C and D.

*The chart depicts the components of changes in the actuarial value of assets over the last ten years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.*

- Sheriffs Transfer
- Net investment income
- Benefits paid
- Net contributions

**CHART 6**

**Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended December 31, 2004 – 2013**



## SECTION 2: Valuation Results for the Barnstable County Retirement System

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

*The chart shows the determination of the actuarial value of assets as of the valuation date.*

### CHART 7

#### Determination of Actuarial Value of Assets

	Year Ended	
	December 31, 2013	December 31, 2012
1. Actuarial value of assets at the beginning of the year	\$706,630,211	\$651,063,981
2. Contributions, less benefit payments and expenses during the year	10,048,069	9,682,816
3. Average actuarial value: (1) + [50% of (2)]	711,654,246	655,905,389
4. Expected investment income: .07875 x (3)	56,042,772	51,652,549
5. Preliminary actuarial value of assets at the end of the year: (1) + (2) + (4)	772,721,052	712,399,346
6. Market value of assets at the end of the year	793,984,292	683,553,671
7. Adjustment toward market value: 20% of [(6) - (5)]	4,252,648	-5,769,135
8. Adjustment to be within 20% corridor	0	0
9. Final actuarial value of assets at the end of the year: (5) + (7) + (8)	<u>\$776,973,700</u>	<u>\$706,630,211</u>
10. Actuarial value as a percentage of market value: (9) ÷ (6)	97.9%	103.4%

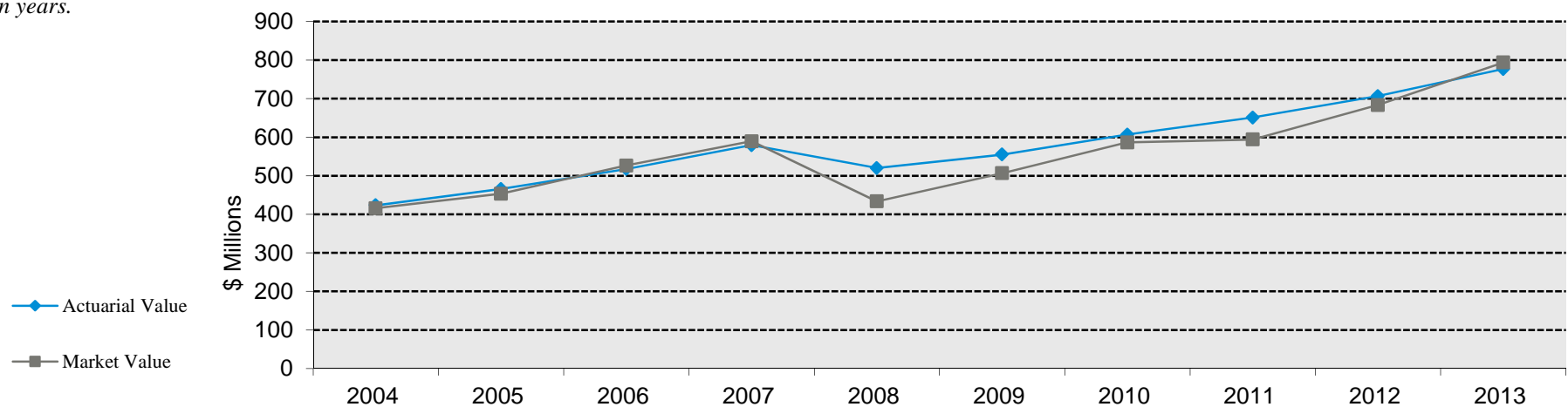
## SECTION 2: Valuation Results for the Barnstable County Retirement System

Both the actuarial value and market value of assets are representations of the Barnstable County Retirement System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Barnstable County Retirement System's liabilities are compared to its assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

*This chart shows the change in the actuarial value of assets versus the market value over the past ten years.*

**CHART 8**

**Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2004 – 2013**



## SECTION 2: Valuation Results for the Barnstable County Retirement System

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### C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The net experience loss for the two-year period ending December 31, 2013 is \$2,244,630. A discussion of the major components of the actuarial experience is on the following pages.

*This chart provides a summary of the actuarial experience over the past two years.*

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### CHART 9

#### Actuarial Experience for Two-Year Period Ended December 31, 2013

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1. Net loss from investments*	-\$1,516,487
2. Net gain from administrative expenses	240,466
3. Net loss from other experience**	<u>-968,609</u>
4. Net experience loss: (1) + (2) + (3)	-\$2,244,630

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\* Details in Chart 10

\*\* Details in Chart 13



## SECTION 2: Valuation Results for the Barnstable County Retirement System

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### Investment Rate of Return

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Barnstable County Retirement System's investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets was 7.875% for 2013 and 2012. The actual rates of return on an actuarial basis for the 2013 and 2012 plan years were 8.47% and 7.00%, respectively.

Since the actual return for the two-year period was less than the assumed return, the Barnstable County Retirement System experienced an actuarial loss of \$1,516,487 during the two-year period ending December 31, 2013 with regard to its investments.

*This chart shows the gain/(loss) due to investment experience.*

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### CHART 10 Actuarial Value Investment Experience

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	Year Ended	
	December 31, 2013	December 31, 2012
1. Actual return	\$60,295,420	\$45,883,414
2. Average value of assets	711,654,246	655,905,389
3. Actual rate of return: (1) ÷ (2)	8.47%	7.00%
4. Assumed rate of return	7.875%	7.875%
5. Expected return: (2) x (4)	\$56,042,772	\$51,652,549
6. Actuarial gain/(loss): (1) – (5)	<u>\$4,252,648</u>	<u>-\$5,769,135</u>

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## SECTION 2: Valuation Results for the Barnstable County Retirement System

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last ten years, including five-year and ten-year averages.

Based upon this experience and future expectations, we have decreased the assumed rate of return from 7.875% to 7.75%.

### CHART 11

#### Investment Return – Actuarial Value vs. Market Value: 2004 - 2013

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2004	\$29,977,086	7.77%	\$39,712,304	10.77%
2005	32,279,873	7.54	27,463,017	6.53
2006	41,126,626	8.73	62,425,689	13.61
2007	45,884,534	8.73	46,934,182	8.78
2008	-79,377,767	-13.47	-176,200,834	-29.39
2009	31,460,127	5.96	69,758,113	15.81
2010	39,828,569	7.10	68,065,161	13.28
2011	34,646,341	5.67	-2,301,715	-0.39
2012	45,883,414	7.00	79,901,995	13.34
2013	<u>60,295,420</u>	8.47	<u>100,382,552</u>	14.58
Total	\$282,004,223		\$316,140,464	
	Five-year average return	6.91%		11.15%
	Ten-year average return	5.16%		6.06%

*Note: Each year's yield is weighted by the average asset value in that year.*

## SECTION 2: Valuation Results for the Barnstable County Retirement System

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

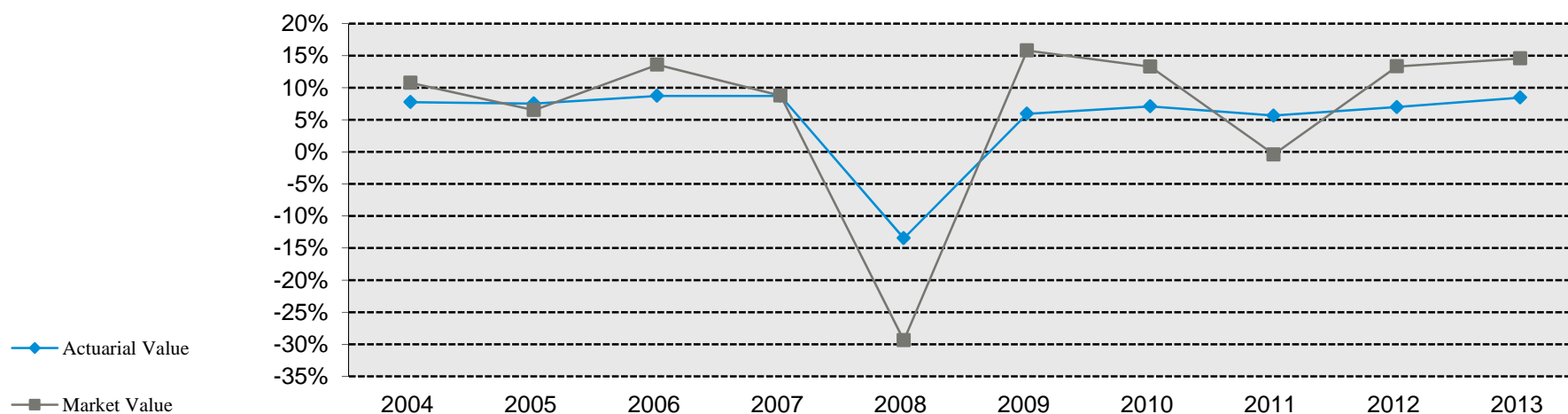
### Administrative Expenses

Administrative expenses for the years ended December 31, 2012 and 2013 were \$1,065,300 and \$1,104,266, respectively, compared to the assumption of \$1,150,000 for 2012 and \$1,201,750 for 2013. This resulted in a gain of \$240,466 for the two-year period, including an adjustment for interest. We have reset the assumption to \$1,150,000 for calendar year 2014.

*This chart illustrates how this leveling effect has actually worked over the years 2004 - 2013.*

**CHART 12**

**Market and Actuarial Rates of Return for Years Ended December 31, 2004 - 2013**



## SECTION 2: Valuation Results for the Barnstable County Retirement System

### Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net loss from this other experience for the two-year period ending December 31, 2013 amounted to \$968,609, which is 0.1% of the actuarial accrued liability.

A brief summary of the demographic gain/(loss) experience of the Barnstable County Retirement System for the two-year period ending December 31, 2013 is shown in the chart below.

This valuation reflects the following changes in actuarial assumptions and method:

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The investment return assumption was decreased from 7.875% to 7.75%.
- The assumed rates of salary increases were revised to more accurately reflect recent experience and future expectations.
- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally using Scale AA from 2010.
- The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale AA from 2010.

*The chart shows elements of the experience gain/(loss) for the most recent years.*

### CHART 13

#### Experience Due to Sources Other than Investments and Administrative Expenses for the Two-Year Period Ended December 31, 2013

1. Salary increases for continuing actives less than expected	\$13,241,642
2. Fewer deaths than expected amongst retired members and beneficiaries and changes in benefit amounts provided in the data	-2,538,230
3. Loss from participants transferring into the System	-5,796,401
4. Miscellaneous loss	<u>-5,875,620</u>
5. Total	-\$968,609

## SECTION 2: Valuation Results for the Barnstable County Retirement System

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- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally using Scale AA from 2010.
- The assumed retirement age for inactive vested participants was changed from age 65 to age 55 for Group 1 and 2 members hired prior to April 2, 2012.

The changes in assumptions and method increased the unfunded liability by \$34.0 million and decreased the normal cost by \$1.6 million.

The following plan changes are included in this valuation:

- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$15,000 as of July 1, 2013.
- Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.
- As permitted by Section 63 of Chapter 139 of the Acts of 2012, the Board has increased the Section 101 annual allowance from \$9,000 to \$12,000.
- As permitted by Section 29 of Chapter 176 of the Acts of 2011, the Board has increased the Section 12 monthly allowance from \$250 to \$500.

The plan changes increased the unfunded liability by \$6.2 million and the normal cost by \$191,000.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

The unfunded liability was expected to increase from \$522.4 million as of January 1, 2012 to \$534.4 million as of January 1, 2014. The actual unfunded liability as of January 1, 2014 of \$576.8 million is \$42.5 million higher than expected as detailed in Chart 14 below.

### CHART 14

#### Development of Unfunded Actuarial Accrued Liability and (Gain)/Loss

	Year Ended	
	December 31, 2013	December 31, 2012
1. Unfunded actuarial accrued liability at beginning of year	\$529,576,328	\$522,419,867
2. Normal cost at beginning of year, including administrative expenses	37,461,593	35,848,414
3. Total contributions	-73,484,279	-69,053,446
4. Interest		
(a) For whole year on (1) + (2)	\$44,654,235	\$43,963,628
(b) For half year on (3)	<u>-3,830,985</u>	<u>-3,602,135</u>
(c) Total interest	<u>40,823,250</u>	<u>40,361,493</u>
5. Expected unfunded actuarial accrued liability	\$534,376,892	\$529,576,328
6. Changes due to:		
(a) Experience loss	\$2,244,630	--
(b) Changes in actuarial assumptions and cost method	34,016,171	--
(c) Changes to plan provisions	<u>6,198,708</u>	--
(d) Total changes	<u>42,459,509</u>	--
7. Unfunded actuarial accrued liability at end of year	<u>\$576,836,401</u>	--

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### D. RECOMMENDED CONTRIBUTION

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

Because the fiscal 2015 appropriation has already been budgeted at \$52,473,575, the results of this valuation will first be reflected in the fiscal 2016 appropriation. Appropriations for fiscal 2016 and later years are shown in Charts 16 through 19 of the following pages. In projecting the unfunded actuarial accrued liability for future fiscal years, the deferred investment losses have been reflected in accordance with the asset valuation method approved by the Board.

*The chart compares this valuation's recommended contribution with the prior valuation.*

**CHART 15**  
**Recommended Contribution**

	Year Beginning January 1			
	2014		2012	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$35,328,892	13.92%	\$34,698,414	14.49%
2. Administrative expenses	1,150,000	0.45%	1,150,000	0.48%
3. Expected employee contributions	<u>-24,272,605</u>	<u>-9.56%</u>	<u>-22,571,198</u>	<u>-9.42%</u>
4. Employer normal cost: (1) + (2) + (3)	\$12,206,287	4.81%	\$13,277,216	5.55%
5. Actuarial accrued liability	1,353,810,101		1,173,483,848	
6. Actuarial value of assets	<u>776,973,700</u>		<u>651,063,981</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$576,836,401		\$522,419,867	
8. Employer normal cost projected to July 1, 2014 and 2012, adjusted for timing	12,682,491	4.90%	13,832,331	5.65%
9. Projected unfunded actuarial accrued liability	598,771,744		542,600,374	
10. Payment on projected unfunded actuarial accrued liability, adjusted for timing	39,791,084	15.36%	32,869,756	13.43%
11. Recommended contribution: (8) + (10)	<u>\$52,473,575</u>	<u>20.26%</u>	<u>\$46,702,087</u>	<u>19.08%</u>
12. Projected payroll	\$258,948,715		\$244,765,361	

*Notes: Recommended contributions are assumed to be paid on July 1 and December 31.*

*Recommended contributions set equal to the budgeted amounts determined with the previous valuation.*

## SECTION 2: Valuation Results for the Barnstable County Retirement System

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With the prior valuation, the Board approved a funding schedule that fully funds the System by June 30, 2038, with a two-year phase-in (the appropriation increased 6% per year from fiscal 2013 through fiscal 2015). Chart 16 of Section 2 assumes the Board adopts increases to the retiree Cost of Living Adjustment (COLA) base from \$15,000 to \$16,000 as of July 1, 2015, then to \$17,000 as of July 1, 2016 and to \$18,000 as of July 1, 2017. Chart 16 shows a funding schedule that fully funds the unfunded actuarial accrued liability by June 30, 2036 based on an 8-year level amortization of the 2010 ERI and a 22-year increasing amortization (4.0% per year) of the remaining unfunded liability.

Charts 17 and 18 are based on the same COLA base increases described above. Chart 17 shows a funding schedule that fully funds the System by June 30, 2037 with two 4.0% increases to the total appropriation from fiscal 2015 to fiscal 2017, followed by a 20-year increasing amortization (4.0% per year) of the remaining unfunded liability. Chart 18 shows a funding schedule that fully funds the System by June 30, 2035 with four 5.0% increases to the total appropriation from fiscal 2015 to fiscal 2019, followed by a 16-year increasing amortization (4.0% per year) of the remaining unfunded liability.

Chart 19 assumes the Board adopts only an increase to the COLA base from \$15,000 to \$16,000 as of July 1, 2015. It shows a funding schedule that fully funds the System by June 30, 2036 based on a 22-year increasing amortization (4.0% per year) of the remaining unfunded liability.



## SECTION 2: Valuation Results for the Barnstable County Retirement System

### CHART 16

**Funding Schedule 1 – Fully Funded by 2036 with COLA base increased to \$16,000 effective July 1, 2015, \$17,000 effective July 1, 2016 and \$18,000 effective July 1, 2017**

(1) Fiscal Year Ended June 30,	(2) Employer Normal Cost	(3) Amortization of ERI (2002) Liability	(4) Amortization of ERI (2003) Liability	(5) Amortization of ERI (2010) Liability	(6) Amortization of Remaining Liability	(7) Plan Cost Without Retired County Sheriff Liability: (2)+(3)+(4) +(5)+(6)	(8) Amortization of Retired County Sheriff Liability	(9) Total Appropriation: (7)+(8)	(10) Total UAL at Beginning of Fiscal Year	(11) Increase Over Prior Appropriation
2015	\$12,682,491	\$398,358	\$187,423	\$263,893	\$37,856,333	\$51,388,498	\$1,085,077	\$52,473,575	\$598,771,744	-
2016	13,414,430	414,292	194,920	263,893	38,981,509	53,269,044	1,306,971	54,576,015	606,693,833	4.01%
2017	14,179,273	430,864	202,717	263,893	40,865,470	55,942,217	1,359,250	57,301,467	614,829,148	4.99%
2018	14,978,560	448,098	210,825	263,893	42,905,626	58,807,002	1,413,620	60,220,622	622,475,592	5.09%
2019	15,643,228	466,022	219,258	263,893	44,490,138	61,082,539	1,470,165	62,552,704	621,119,141	3.87%
2020	16,337,205	484,663	228,029	263,893	46,171,011	63,484,801	1,528,972	65,013,773	618,385,726	3.93%
2021	17,061,778	504,050	237,150	263,893	47,950,122	66,016,993	1,590,130	67,607,123	614,004,893	3.99%
2022	17,818,288	524,212	246,636	263,893	49,830,003	68,683,032	1,653,736	70,336,768	607,691,388	4.04%
2023	18,608,135	545,180	256,501	-	51,823,203	71,233,019	1,719,885	72,952,904	599,245,011	3.72%
2024	19,432,781	566,987	266,761	-	53,896,131	74,162,660	1,788,681	75,951,341	588,212,594	4.11%
2025	20,293,751	589,667	277,432	-	56,051,977	77,212,827	1,860,228	79,073,055	574,026,208	4.11%
2026	21,192,637	613,253	288,529	-	58,294,056	80,388,475	1,934,637	82,323,112	556,349,462	4.11%
2027	22,131,099	637,784	300,070	-	60,625,818	83,694,771	2,012,022	85,706,793	534,816,218	4.11%
2028	23,110,872	663,295	312,073	-	63,050,851	87,137,091	2,092,503	89,229,594	509,028,134	4.11%
2029	24,133,765	689,827	324,556	-	65,572,885	90,721,033	2,176,203	92,897,236	478,552,020	4.11%
2030	25,201,664	717,420	337,538	-	68,195,800	94,452,422	2,263,252	96,715,674	442,916,975	4.11%
2031	26,316,542	746,117	351,040	-	70,923,632	98,337,331	2,353,782	100,691,113	401,611,302	4.11%
2032	27,480,454	775,961	365,081	-	73,760,577	102,382,073	2,447,933	104,830,006	354,079,169	4.11%
2033	28,695,546	807,000	379,684	-	76,711,001	106,593,231	2,545,850	109,139,081	299,717,016	4.11%
2034	29,964,058	839,280	394,872	-	79,779,441	110,977,651	2,647,684	113,625,335	237,869,665	4.11%
2035	31,288,326	872,851	410,667	-	82,970,618	115,542,462	2,753,592	118,296,054	167,826,126	4.11%
2036	32,670,789	907,733	427,094	-	86,289,444	120,295,060	2,863,734	123,158,794	88,815,076	4.11%
2037	34,113,991	-	-	-	-	34,113,991	-	34,113,991	-	-72.30%
2038	35,620,590	-	-	-	-	35,620,590	-	35,620,590	-	4.42%

Notes: Recommended contributions are assumed to be paid on July 1 and December 31.

Item (2) reflects 4.0% growth in payroll and 0.15% adjustment to total normal cost to reflect the effects of mortality improvement due to the generational mortality assumption.

Projected normal cost does not reflect the future impact of pension reform for future hires.

Amortization payments calculated to increase 4.0% per year, except for 2010 ERI amortization payments, which are level.

Reflects deferred investment gains.

The Retiree Sheriff 2002 ERI payment is included in item (8).

Fiscal 2016, 2017 and 2018 amounts are adjusted to reflect the increase in the COLA base effective that July 1.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### CHART 17

**Funding Schedule 2 – Fully Funded by 2037 with COLA base increased to \$16,000 effective July 1, 2015, \$17,000 effective July 1, 2016 and \$18,000 effective July 1, 2017, and with 4.0% increases to total appropriations through Fiscal 2017**

(1) Fiscal Year Ended June 30,	(2) Employer Normal Cost	(3) Amortization of ERI (2002) Liability	(4) Amortization of ERI (2003) Liability	(5) Amortization of ERI (2010) Liability	(6) Amortization of Remaining Liability	(7) Plan Cost Without Retired County Sheriff Liability: (2)+(3)+(4) +(5)+(6)	(8) Amortization of Retired County Sheriff Liability	(9) Total Appropriation: (7)+(8)	(10) Total UAL at Beginning of Fiscal Year	(11) Increase Over Prior Appropriation
2015	\$12,682,491	\$386,945	\$182,053	\$263,893	\$37,873,116	\$51,388,498	\$1,085,077	\$52,473,575	\$598,771,744	-
2016	13,414,430	402,423	189,335	263,893	39,035,405	53,305,486	1,267,032	54,572,518	606,693,833	4.00%
2017	14,179,273	418,519	196,909	263,893	40,379,112	55,437,706	1,317,713	56,755,419	614,832,904	4.00%
2018	14,978,560	435,260	204,785	263,893	41,435,690	57,318,188	1,370,422	58,688,610	623,066,146	3.41%
2019	15,643,228	452,671	212,976	263,893	42,968,042	59,540,810	1,425,239	60,966,049	623,399,066	3.88%
2020	16,337,205	470,777	221,496	263,893	44,593,459	61,886,830	1,482,248	63,369,078	622,539,451	3.94%
2021	17,061,778	489,609	230,355	263,893	46,313,630	64,359,265	1,541,538	65,900,803	620,235,311	4.00%
2022	17,818,288	509,193	239,570	263,893	48,130,851	66,961,795	1,603,200	68,564,995	616,221,405	4.04%
2023	18,608,135	529,561	249,152	-	50,056,085	69,442,933	1,667,328	71,110,261	610,309,895	3.71%
2024	19,432,781	550,743	259,118	-	52,058,329	72,300,971	1,734,021	74,034,992	602,083,749	4.11%
2025	20,293,751	572,773	269,483	-	54,140,662	75,276,669	1,803,382	77,080,051	590,999,068	4.11%
2026	21,192,637	595,684	280,263	-	56,306,288	78,374,872	1,875,517	80,250,389	576,745,479	4.11%
2027	22,131,099	619,511	291,473	-	58,558,540	81,600,623	1,950,538	83,551,161	558,984,995	4.11%
2028	23,110,872	644,291	303,132	-	60,900,881	84,959,176	2,028,559	86,987,735	537,349,744	4.11%
2029	24,133,765	670,063	315,257	-	63,336,917	88,456,002	2,109,702	90,565,704	511,439,497	4.11%
2030	25,201,664	696,866	327,868	-	65,870,393	92,096,791	2,194,090	94,290,881	480,819,013	4.11%
2031	26,316,542	724,740	340,982	-	68,505,209	95,887,473	2,281,853	98,169,326	445,015,158	4.11%
2032	27,480,454	753,730	354,622	-	71,245,417	99,834,223	2,373,127	102,207,350	403,513,812	4.11%
2033	28,695,546	783,879	368,806	-	74,095,234	103,943,465	2,468,052	106,411,517	355,756,511	4.11%
2034	29,964,058	815,234	383,559	-	77,059,043	108,221,894	2,566,775	110,788,669	301,136,834	4.11%
2035	31,288,326	847,844	398,901	-	80,141,405	112,676,476	2,669,446	115,345,922	238,996,501	4.11%
2036	32,670,789	881,757	414,857	-	83,347,061	117,314,464	2,776,223	120,090,687	168,621,153	4.11%
2037	34,113,991	916,995	431,452	-	86,680,945	122,143,383	2,887,276	125,030,659	89,235,813	4.11%
2038	35,620,590	-	-	-	-	35,620,590	-	35,620,590	-	-71.51%

Notes: Recommended contributions are assumed to be paid on July 1 and December 31.

Item (2) reflects 4.0% growth in payroll and 0.15% adjustment to total normal cost to reflect the effects of mortality improvement due to the generational mortality assumption.

Projected normal cost does not reflect the future impact of pension reform for future hires.

Amortization payments calculated to increase 4.0% per year, except for 2010 ERI amortization payments, which are level.

Reflects deferred investment gains.

The Retiree Sheriff 2002 ERI payment is included in item (8).

Fiscal 2016, 2017 and 2018 amounts are adjusted to reflect the increase in the COLA base effective that July 1.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### CHART 18

**Funding Schedule 3 – Fully Funded by 2035 with COLA base increased to \$16,000 effective July 1, 2015, \$17,000 effective July 1, 2016 and \$18,000 effective July 1, 2017, and with 5.0% increases to total appropriations through Fiscal 2019**

(1) Fiscal Year Ended June 30,	(2) Employer Normal Cost	(3) Amortization of ERI (2002) Liability	(4) Amortization of ERI (2003) Liability	(5) Amortization of ERI (2010) Liability	(6) Amortization of Remaining Liability	(7) Plan Cost Without Retired County Sheriff Liability: (2)+(3)+(4) +(5)+(6)	(8) Amortization of Retired County Sheriff Liability	(9) Total Appropriation: (7)+(8)	(10) Total UAL at Beginning of Fiscal Year	(11) Increase Over Prior Appropriation
2015	\$12,682,491	\$410,914	\$193,331	\$263,893	\$37,837,869	\$51,388,498	\$1,085,077	\$52,473,575	\$598,771,744	-
2016	13,414,430	427,350	201,064	263,893	39,439,421	53,746,158	1,351,096	55,097,254	606,693,833	5.00%
2017	14,179,273	444,444	209,107	263,893	41,350,260	56,446,977	1,405,140	57,852,117	614,269,277	5.00%
2018	14,978,560	462,222	217,471	263,893	43,361,231	59,283,377	1,461,346	60,744,723	621,282,726	5.00%
2019	15,643,228	480,711	226,170	263,893	45,648,158	62,262,160	1,519,799	63,781,959	619,274,446	5.00%
2020	16,337,205	499,940	235,216	263,893	48,035,749	65,372,003	1,580,591	66,952,594	615,082,645	4.97%
2021	17,061,778	519,937	244,625	263,893	49,884,073	67,974,306	1,643,815	69,618,121	608,371,942	3.98%
2022	17,818,288	540,735	254,410	263,893	51,837,531	70,714,857	1,709,568	72,424,425	599,476,194	4.03%
2023	18,608,135	562,364	264,587	-	53,911,033	73,346,119	1,777,950	75,124,069	588,185,276	3.73%
2024	19,432,781	584,859	275,170	-	56,067,474	76,360,284	1,849,068	78,209,352	573,999,551	4.11%
2025	20,293,751	608,253	286,177	-	58,310,173	79,498,354	1,923,031	81,421,385	556,323,629	4.11%
2026	21,192,637	632,583	297,624	-	60,642,580	82,765,424	1,999,952	84,765,376	534,791,388	4.11%
2027	22,131,099	657,886	309,529	-	63,068,283	86,166,797	2,079,950	88,246,747	509,004,505	4.11%
2028	23,110,872	684,202	321,910	-	65,591,014	89,707,998	2,163,148	91,871,146	478,529,810	4.11%
2029	24,133,765	711,570	334,786	-	68,214,655	93,394,776	2,249,674	95,644,450	442,896,424	4.11%
2030	25,201,664	740,033	348,178	-	70,943,241	97,233,116	2,339,661	99,572,777	401,592,673	4.11%
2031	26,316,542	769,634	362,105	-	73,780,971	101,229,252	2,433,248	103,662,500	354,062,753	4.11%
2032	27,480,454	800,419	376,589	-	76,732,209	105,389,671	2,530,578	107,920,249	299,703,129	4.11%
2033	28,695,546	832,436	391,653	-	79,801,498	109,721,133	2,631,801	112,352,934	237,858,655	4.11%
2034	29,964,058	865,734	407,319	-	82,993,558	114,230,669	2,737,073	116,967,742	167,818,376	4.11%
2035	31,288,326	900,391	423,612	-	86,313,301	118,925,630	2,846,551	121,772,181	88,811,003	4.11%
2036	32,670,789	-	-	-	-	32,670,789	-	32,670,789	-	-73.17%
2037	34,113,991	-	-	-	-	34,113,991	-	34,113,991	-	4.42%
2038	35,620,590	-	-	-	-	35,620,590	-	35,620,590	-	4.42%

Notes: Recommended contributions are assumed to be paid on July 1 and December 31.

Item (2) reflects 4.0% growth in payroll and 0.15% adjustment to total normal cost to reflect the effects of mortality improvement due to the generational mortality assumption.

Projected normal cost does not reflect the future impact of pension reform for future hires.

Amortization payments calculated to increase 4.0% per year, except for 2010 ERI amortization payments, which are level.

Reflects deferred investment gains.

The Retiree Sheriff 2002 ERI payment is included in item (8).

Fiscal 2016, 2017 and 2018 amounts are adjusted to reflect the increase in the COLA base effective that July 1.

## SECTION 2: Valuation Results for the Barnstable County Retirement System

### CHART 19

#### Funding Schedule 4 – Fully Funded by 2036 with COLA base increased to \$16,000 effective July 1, 2015

(1) Fiscal Year Ended June 30,	(2) Employer Normal Cost	(3) Amortization of ERI (2002) Liability	(4) Amortization of ERI (2003) Liability	(5) Amortization of ERI (2010) Liability	(6) Amortization of Remaining Liability	(7) Plan Cost Without Retired County Sheriff Liability: (2)+(3)+(4) +(5)+(6)	(8) Amortization of Retired County Sheriff Liability	(9) Total Appropriation: (7)+(8)	(10) Total UAL at Beginning of Fiscal Year	(11) Increase Over Prior Appropriation
2015	\$12,682,491	\$398,358	\$187,423	\$263,893	\$37,856,333	\$51,388,498	\$1,085,077	\$52,473,575	\$598,771,744	-
2016	13,414,430	414,292	194,920	263,893	38,981,509	53,269,044	1,306,971	54,576,015	606,693,833	4.01%
2017	14,010,911	430,864	202,717	263,893	40,336,394	55,244,779	1,359,250	56,604,029	607,255,268	3.72%
2018	14,633,741	448,098	210,825	263,893	41,783,986	57,340,543	1,413,620	58,754,163	606,980,616	3.80%
2019	15,284,077	466,022	219,258	263,893	43,324,765	59,558,015	1,470,165	61,028,180	605,624,595	3.87%
2020	15,963,128	484,663	228,029	263,893	44,959,874	61,899,587	1,528,972	63,428,559	602,933,683	3.93%
2021	16,672,155	504,050	237,150	263,893	46,691,125	64,368,373	1,590,130	65,958,503	598,643,331	3.99%
2022	17,412,471	524,212	246,636	263,893	48,520,979	66,968,191	1,653,736	68,621,927	592,474,658	4.04%
2023	18,185,453	545,180	256,501	-	50,461,818	69,448,952	1,719,885	71,168,837	584,233,382	3.71%
2024	18,992,532	566,987	266,761	-	52,480,290	72,306,570	1,788,681	74,095,251	573,477,337	4.11%
2025	19,835,205	589,667	277,432	-	54,579,502	75,281,806	1,860,228	77,142,034	559,646,333	4.11%
2026	20,715,034	613,253	288,529	-	56,762,682	78,379,498	1,934,637	80,314,135	542,412,405	4.11%
2027	21,633,647	637,784	300,070	-	59,033,189	81,604,690	2,012,022	83,616,712	521,418,588	4.11%
2028	22,592,746	663,295	312,073	-	61,394,517	84,962,631	2,092,503	87,055,134	496,276,519	4.11%
2029	23,594,105	689,827	324,556	-	63,850,298	88,458,786	2,176,203	90,634,989	466,563,859	4.11%
2030	24,639,577	717,420	337,538	-	66,404,310	92,098,845	2,263,252	94,362,097	431,821,504	4.11%
2031	25,731,094	746,117	351,040	-	69,060,482	95,888,733	2,353,782	98,242,515	391,550,576	4.11%
2032	26,870,675	775,961	365,081	-	71,822,901	99,834,618	2,447,933	102,282,551	345,209,166	4.11%
2033	28,060,425	807,000	379,684	-	74,695,817	103,942,926	2,545,850	106,488,776	292,208,834	4.11%
2034	29,302,540	839,280	394,872	-	77,683,650	108,220,342	2,647,684	110,868,026	231,910,814	4.11%
2035	30,599,316	872,851	410,667	-	80,790,996	112,673,830	2,753,592	115,427,422	163,621,929	4.11%
2036	31,953,143	907,733	427,094	-	84,022,637	117,310,607	2,863,734	120,174,341	86,590,177	4.11%
2037	33,366,521	-	-	-	-	33,366,521	-	33,366,521	-	-72.23%
2038	34,842,054	-	-	-	-	34,842,054	-	34,842,054	-	4.42%

Notes: Recommended contributions are assumed to be paid on July 1 and December 31.

Item (2) reflects 4.0% growth in payroll and 0.15% adjustment to total normal cost to reflect the effects of mortality improvement due to the generational mortality assumption.

Projected normal cost does not reflect the future impact of pension reform for future hires.

Amortization payments calculated to increase 4.0% per year, except for 2010 ERI amortization payments, which are level.

Reflects deferred investment gains.

The Retiree Sheriff 2002 ERI payment is included in item (8).

Fiscal 2016 amounts are adjusted to reflect the increase in the COLA base effective July 1, 2015.

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT A

#### Table of Plan Coverage

	Year Ended December 31		Change From Prior Year
Category	2013	2011	
Active participants in valuation:			
Number	4,696	4,670	0.6%
Average age	48.9	48.8	N/A
Average service	12.2	11.9	N/A
Total payroll for prior year	\$243,205,954	\$227,741,789	6.8%
Average payroll for prior year	51,790	48,767	6.2%
Member contributions	223,293,103	203,798,643	9.6%
Number with unknown age information	1	3	N/A
Inactive participants entitled to a return of their employee contributions	513	526	-2.5%
Inactive participants with a vested right to a deferred or immediate benefit	138	111	24.3%
Retired participants:			
Number in pay status	2,072	1,930	7.4%
Average age	71.6	71.6	N/A
Average monthly benefit	\$1,920	\$1,766	8.7%
Number in suspended status	3	3	N/A
Disabled participants:			
Number in pay status	357	335	6.6%
Average age	62.8	61.8	N/A
Average monthly benefit	\$2,648	\$2,478	6.9%
Number in suspended status	4	6	N/A
Beneficiaries in pay status			
Number	293	282	3.9%
Average age	72.4	71.4	N/A
Average monthly benefit	\$1,135	\$1,010	12.4%

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT B

#### Participants in Active Service as of December 31, 2013 By Age, Years of Service, and Average Payroll

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	91	87	4	--	--	--	--	--	--	--
	\$33,574	\$32,939	\$47,379	--	--	--	--	--	--	--
25 - 29	268	212	53	3	--	--	--	--	--	--
	\$44,267	\$42,626	\$49,451	\$68,604	--	--	--	--	--	--
30 - 34	362	162	157	43	--	--	--	--	--	--
	\$50,855	\$43,127	\$53,925	\$68,763	--	--	--	--	--	--
35 - 39	357	119	107	101	28	2	--	--	--	--
	\$53,983	\$41,352	\$53,574	\$65,530	\$67,016	\$61,937	--	--	--	--
40 - 44	524	139	96	133	112	41	3	--	--	--
	\$56,132	\$37,374	\$46,819	\$63,723	\$70,579	\$75,553	\$81,915	--	--	--
45 - 49	726	158	139	137	102	92	88	10	--	--
	\$55,950	\$35,992	\$43,244	\$55,603	\$68,110	\$73,999	\$76,884	\$78,338	--	--
50 - 54	782	143	172	152	100	82	83	45	5	--
	\$52,409	\$36,094	\$41,001	\$46,764	\$58,281	\$66,292	\$76,143	\$81,229	\$84,568	--
55 - 59	772	102	132	171	132	82	70	57	23	3
	\$52,001	\$40,109	\$45,349	\$46,027	\$49,285	\$54,983	\$65,400	\$78,191	\$82,215	\$85,717
60 - 64	538	64	103	105	97	51	59	34	14	11
	\$50,876	\$36,098	\$42,581	\$46,466	\$51,371	\$52,988	\$61,592	\$72,750	\$77,118	\$83,968
65 - 69	195	18	37	52	30	21	24	4	3	6
	\$46,879	\$33,415	\$43,776	\$39,786	\$50,406	\$50,748	\$55,559	\$42,391	\$79,408	\$88,728
70 & over	80	8	20	19	8	7	8	3	4	3
	\$36,348	\$18,307	\$30,787	\$29,507	\$34,972	\$49,870	\$56,570	\$42,151	\$49,749	\$59,373
Unknown	1	1	--	--	--	--	--	--	--	--
	\$23,808	\$23,808	--	--	--	--	--	--	--	--
Total	4,696	1,213	1,020	916	609	378	335	153	49	23
	\$51,790	\$38,768	\$46,249	\$52,796	\$58,846	\$63,733	\$69,640	\$76,242	\$78,177	\$82,230

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT C

#### Summary Statement of Income and Expenses on an Actuarial Value Basis

	Year Ended December 31, 2013	Year Ended December 31, 2012
Net assets at actuarial value at the beginning of the year	\$706,630,211	\$651,063,981
<b>Contribution income:</b>		
Employer contributions	\$48,540,969	\$45,725,078
Employee contributions	24,760,772	23,220,718
Federal grant reimbursement contributions	182,538	107,650
Less administrative expenses	<u>-1,104,266</u>	<u>-1,065,300</u>
Net contribution income	\$72,380,013	\$67,988,146
<b>Investment income</b>	<u>60,295,420</u>	<u>45,883,414</u>
<b>Total income available for benefits</b>	\$132,675,433	\$113,871,560
<b>Less benefit payments:</b>		
Pensions	-\$60,758,259	-\$56,589,211
Net 3(8)(c) reimbursements	792,406	729,420
Refunds, annuities and Option B refunds	<u>-2,366,091</u>	<u>-2,445,539</u>
Net benefit payments	-\$62,331,944	-\$58,305,330
<b>Change in reserve for future benefits</b>	\$70,343,489	\$55,566,230
<b>Net assets at actuarial value at the end of the year</b>	\$776,973,700	\$706,630,211

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT D

#### Development of the Fund Through December 31, 2013

Year Ended December 31	Employer Contributions	Employee Contributions	Other Contributions	Net Investment Return*	Administrative Expenses	Benefit Payments	Preliminary Actuarial Value of Assets	Transfer to State Retirement System	Actuarial Value of Assets at End of Year
2004	\$31,199,609	\$17,519,703	\$167,025	\$29,977,087	\$706,303	\$33,306,836	\$423,167,585	--	\$423,167,585
2005	27,846,430	19,027,004	122,481	32,279,864	780,532	36,024,848	465,637,984	--	465,637,984
2006	31,044,132	19,753,749	122,894	41,126,626	1,032,312	39,256,986	517,396,087	--	517,396,087
2007	36,738,676	21,222,808	104,229	45,884,534	890,150	41,078,574	579,377,610	--	579,377,610
2008	41,826,233	22,037,322	109,158	-79,377,767	955,794	42,926,907	520,089,855	--	520,089,855
2009	39,820,453	23,266,441	116,859	31,460,128	1,105,896	46,373,532	567,274,308	\$12,397,754	554,876,554
2010	40,770,344	21,742,489**	166,011	39,828,569	987,783	49,810,805	606,585,379	--	606,585,379
2011	43,048,024	21,754,938	118,153	34,646,341	1,080,590	54,008,264	651,063,981	--	651,063,981
2012	45,725,078	23,220,718	107,650	45,883,414	1,065,300	58,305,330	706,630,211	--	706,630,211
2013	48,540,969	24,760,772	182,538	60,295,420	1,104,266	62,331,944	776,973,700	--	776,973,700

\* Net of investment expenses.

\*\* Excludes Annuity Savings Fund transfer of \$12,397,754 to the State Retirement System for the county sheriffs, which was previously reflected in the December 31, 2009 actuarial value of assets.



### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT E

Table of Amortization Bases as of July 1, 2014

Type	Annual Payment	Years Remaining	Outstanding Balance
2002 ERI liability	\$398,358	22.00	\$6,080,954
2003 ERI liability	187,423	22.00	2,861,024
2010 ERI liability	263,893	8.00	1,619,147
Retired county sheriffs liability	1,085,077	22.00	19,015,213
Remaining unfunded liability	<u>37,856,333</u>	22.00	<u>569,195,406</u>
Total	\$39,791,084		\$598,771,744

*Notes: Payments assumed to be made on July 1 and December 31.*

*Amortization payments calculated to increase 4.0% per year, except for 2010 ERI amortization payments, which are level.*

*Years remaining reflects the funding schedule shown in Chart 16.*

*Retired county sheriffs liability was recalculated to reflect assumption changes.*

*Payments on remaining unfunded liability and retired county sheriffs liability reflect adjustment to set fiscal 2015 appropriation to budgeted amount.*

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

#### EXHIBIT F

#### Unit Allocation of ERI Amortizations for Fiscal 2015

Unit	2002 ERI	2003 ERI	2010 ERI	Total
Barnstable County	\$82,919	\$26,180	\$0	\$109,099
Barnstable Fire	4,012	0	0	4,012
Barnstable Housing Authority	3,603	0	0	3,603
Bourne Recreation	15,858	0	0	15,858
Bourne Water	4,597	0	0	4,597
C.O.M.M. Fire	0	4,593	0	4,593
Cape Cod Mosquito	2,515	0	0	2,515
County Hospital	7,138	0	0	7,138
Dennis Housing	2,402	0	0	2,402
Hyannis Fire	1,587	0	0	1,587
Mashpee Water	0	3,998	0	3,998
Town of Barnstable	95,907	0	106,449	202,356
Town of Bourne	74,513	0	0	74,513
Town of Brewster	15,743	0	0	15,743
Town of Chatham	0	0	101,497	101,497
Town of Eastham	22,091	0	0	22,091
Town of Mashpee	35,262	0	0	35,262
Town of Nantucket	0	111,036	0	111,036
Town of Truro	12,873	0	0	12,873
Town of Wellfleet	13,483	0	0	13,483
Town of Yarmouth	0	37,749	55,947	93,696
Veterans District	3,855	0	0	3,855
Yarmouth Housing	<u>0</u>	<u>3,867</u>	<u>0</u>	<u>3,867</u>
Total	\$398,358	\$187,423	\$263,893	\$849,674

Note: Based on funding schedule shown in Chart 16 of Section 2.

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

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#### EXHIBIT G

#### Definitions of Pension Terms

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The following list defines certain technical terms for the convenience of the reader:

**Assumptions or actuarial assumptions:**

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

**Normal cost:**

The amount of contributions required to fund the benefit allocated to the current year of service.

**Actuarial accrued liability for actives:**

The equivalent of the accumulated normal costs allocated to the years before the valuation date.

**Actuarial accrued liability for pensioners:**

The single sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

**Unfunded actuarial accrued liability:**

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There are many approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

### SECTION 3: Supplemental Information for the Barnstable County Retirement System

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**Amortization of the unfunded actuarial accrued liability:**

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

**Investment return:**

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

## SECTION 4: Reporting Information for the Barnstable County Retirement System

### EXHIBIT I

#### Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 293 beneficiaries in pay status and 7 retired participants in suspended status)	2,729
2. Participants active during the year ended December 31, 2013 with total accumulated contributions of \$223,293,103 and projected 2014 payroll as of January 1, 2014 of \$253,920,106	4,696
3. Inactive participants with a right to a return of their employee contributions as of December 31, 2013	513
4. Inactive participants with a vested right to a deferred or immediate benefit as of December 31, 2013	138

The actuarial factors as of the January 1, 2014 valuation date are as follows:

1. Normal cost	\$35,328,892
2. Administrative expenses	1,150,000
3. Expected employee contributions	<u>-24,272,605</u>
4. Employer normal cost: (1) + (2) + (3)	\$12,206,287
5. Actuarial accrued liability	1,353,810,101
Retired participants and beneficiaries	\$647,119,562
Active participants	684,303,915
Inactive participants	22,386,624
6. Actuarial value of assets (\$793,984,292 at market value as reported on the draft Annual Statement)	776,973,700
7. Unfunded actuarial accrued liability: (5) - (6)	<u>576,836,401</u>

The actuarial factors projected to July 1, 2014 are as follows:

1. Employer normal cost projected to July 1, 2014, adjusted for timing	\$12,682,491
2. Projected unfunded actuarial accrued liability	598,771,744
3. Payment on projected unfunded actuarial accrued liability, adjusted for timing	39,791,084
4. Recommended contribution: (1) + (3)	<u>\$52,473,575</u>
6. Projected payroll	258,948,715

*Notes: Recommended contributions are assumed to be paid on July 1 and December 31.*

*Recommended contribution set equal to the budgeted amount determined with the previous valuation.*

**SECTION 4: Reporting Information for the Barnstable County Retirement System**

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**EXHIBIT II**

**Supplementary Information Required by the GASB - History of Employer Contributions**

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<b>Plan Year Ended December 31</b>	<b>Annual Required Contribution</b>	<b>Actual Contributions</b>	<b>Percentage Contributed</b>
2004	\$31,199,609	\$31,199,609	100.0%
2005	27,846,430	27,846,430	100.0%
2006	31,044,132	31,044,132	100.0%
2007	36,738,676	36,738,676	100.0%
2008	41,826,233	41,826,233	100.0%
2009	39,820,453	39,820,453	100.0%
2010	40,770,344	40,770,344	100.0%
2011	43,048,024	43,048,024	100.0%
2012	45,725,078	45,725,078	100.0%
2013	48,540,969	48,540,969	100.0%

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**SECTION 4: Reporting Information for the Barnstable County Retirement System****EXHIBIT III****Supplementary Information Required by the GASB - Schedule of Funding Progress**

<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)</b>	<b>Funded Ratio (a) / (b)</b>	<b>Covered Payroll (c)</b>	<b>UAAL as a Percentage of Covered Payroll [(b) - (a)] / (c)</b>
01/01/1998	\$235,247,660	\$404,215,695	\$168,968,035	58.20%	\$121,161,677	139.46%
01/01/2000	300,396,700	462,462,500	162,065,800	64.96%	152,293,100	106.42%
01/01/2002	362,911,896	553,531,966	190,620,070	65.56%	173,610,557	109.80%
01/01/2004	378,317,300	647,655,411	269,338,111	58.41%	190,614,004	141.30%
01/01/2006	465,637,984	765,747,723	300,109,739	60.81%	215,474,180	139.28%
01/01/2007	517,396,087	825,863,068	308,466,981	62.65%	226,391,633	136.25%
01/01/2009	520,089,855	966,564,614	446,474,759	53.81%	249,971,296	178.61%
01/01/2010	554,876,554	1,030,210,321	475,333,767	53.86%	234,374,075	202.81%
01/01/2012	651,063,981	1,173,483,848	522,419,867	55.48%	239,437,303	218.19%
01/01/2014	776,973,700	1,353,810,101	576,836,401	57.39%	253,920,106	227.17%

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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### EXHIBIT IV

#### Supplementary Information Required by the GASB

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<b>Valuation date</b>	January 1, 2014
<b>Actuarial cost method</b>	Entry Age Normal Cost Method
<b>Amortization method</b>	Payments increase at 4.0%, except for 2010 Early Retirement Incentive, which is a level payment.
<b>Remaining amortization period</b>	22 years from July 1, 2014 for 2002 and 2003 Early Retirement Incentives, retiree sheriffs liability and remaining unfunded liability, and 8 years from July 1, 2014 for 2010 Early Retirement Incentive
<b>Asset valuation method</b>	Sum of actuarial value at beginning of the year, contributions and investment earnings based on the actuarial interest assumption less benefit payments and operating expenses plus 20% of the market value at the end of the year in excess of that sum, plus additional adjustment toward market value as necessary so that final actuarial value is within 20% of market value.

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<b>Actuarial assumptions:</b>	
Investment rate of return	7.75% (previously, 7.875%)
Inflation rate	4.0% (previously, 4.5%)
Projected salary increases	Varies by length of service with ultimate rates of 4.25% for Group 1, 4.50% for Group 2 and 4.75% for Group 4. (Previously, varied by length of service with ultimate rates of 4.75% for Groups 1 and 2 and 5.25% for Group 4)
Cost of living adjustments	3% of first \$15,000

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<b>Plan membership:</b>	
Retired participants and beneficiaries receiving benefits	2,729
Inactive participants entitled to a return of their employee contributions	513
Inactive participants with a vested right to a deferred or immediate benefit	138
Active participants	<u>4,696</u>
Total	8,076

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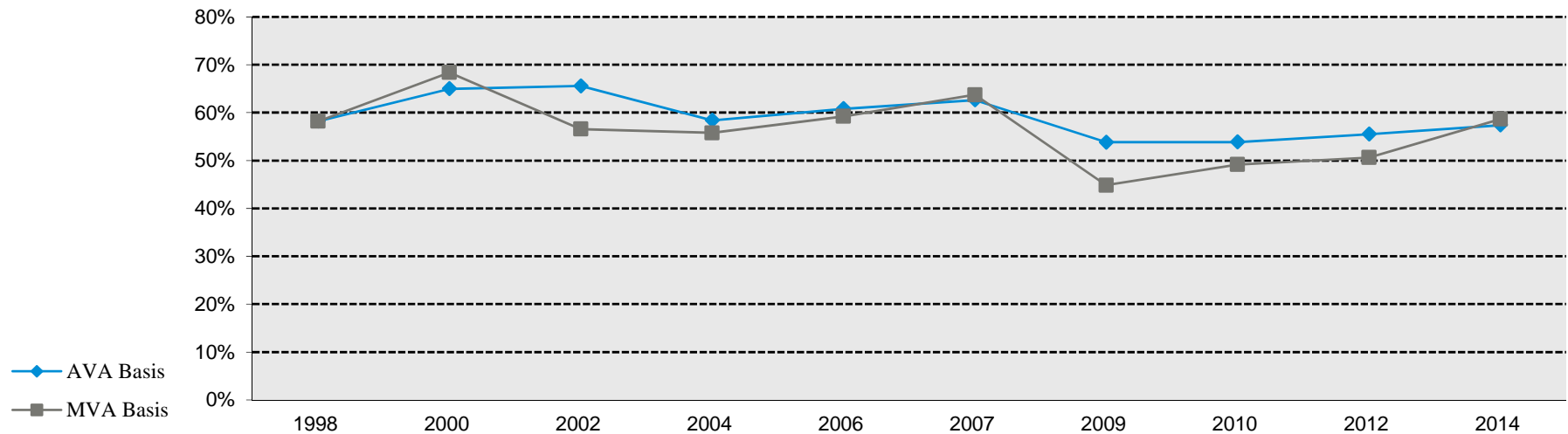
## SECTION 4: Reporting Information for the Barnstable County Retirement System

### EXHIBIT V

#### Funded Ratio

A critical piece of information regarding the System's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the System as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

The chart below depicts a history of the funded ratios for this plan. On a market value basis, the funded ratio has increased from 50.62% as of January 1, 2012 to 58.65% as of January 1, 2014. On an actuarial value basis, the funded ratio has increased from 55.48% as of January 1, 2012 to 57.39% as of January 1, 2014.



## SECTION 4: Reporting Information for the Barnstable County Retirement System

### EXHIBIT VI

#### Actuarial Assumptions and Actuarial Cost Method

##### Mortality Rates:

<i>Pre-Retirement:</i>	RP-2000 Employee Mortality Table projected generationally with Scale AA from 2010 (Previously, RP-2000 Employee Mortality Table projected 12 years with Scale AA)
<i>Healthy Retiree:</i>	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale AA from 2010 (Previously, RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA)
<i>Disabled Retiree:</i>	RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally with Scale AA from 2010 (Previously, RP-2000 Healthy Annuitant Mortality Table set forward two years for males and females projected 12 years with Scale AA)
The mortality tables were determined to contain provisions appropriate to reasonably reflect future mortality improvement, based on a review of the mortality experience of the plan.	

##### Termination Rates before Retirement:

Age	Groups 1 and 2 - Rate (%)		Disability
	Mortality		
	Male	Female	
20	0.03	0.02	0.01
25	0.04	0.02	0.02
30	0.04	0.03	0.03
35	0.08	0.05	0.06
40	0.11	0.07	0.10
45	0.15	0.11	0.15
50	0.21	0.17	0.19
55	0.30	0.25	0.24
60	0.49	0.39	0.28

Notes: Mortality rates do not reflect generational projection.  
55% of the disability rates shown represent accidental disability.  
20% of the accidental disabilities will die from the same cause as the disability.  
55% of the death rates shown represent accidental death.

## SECTION 4: Reporting Information for the Barnstable County Retirement System

Age	Group 4 - Rate (%)		Disability
	Mortality		
	Male	Female	
20	0.03	0.02	0.10
25	0.04	0.02	0.20
30	0.04	0.03	0.30
35	0.08	0.05	0.30
40	0.11	0.07	0.30
45	0.15	0.11	1.00
50	0.21	0.17	1.25
55	0.30	0.25	1.20
60	0.49	0.39	0.85

Notes: Mortality rates do not reflect generational projection.

90% of the disability rates shown represent accidental disability.

60% of the accidental disabilities will die from the same cause as the disability.

90% of the death rates shown represent accidental death.

### Withdrawal Rates:

Years of Service	Rate per year (%)		Years of Service	Group 4
	Groups 1 and 2			
0	15.0		0 – 10	1.5
1	12.0		11+	0.0
2	10.0			
3	9.0			
4	8.0			
5	7.6			
6	7.5			
7	6.7			
8	6.3			
9	5.9			
10	5.4			
11	5.0			
12	4.6			

## SECTION 4: Reporting Information for the Barnstable County Retirement System

		Rate per year (%)		
	Years of Service	Groups 1 and 2	Years of Service	Group 4
	13	4.1		
	14	3.7		
	15	3.3		
	16 – 20	2.0		
	21 – 29	1.0		
	30+	0.0		

### Retirement Rates:

Age	Rate per year (%)		
	Groups 1 and 2		Group 4
	Male	Female	
45 – 49	--	--	1.0
50 – 51	1.0	1.5	2.0
52	1.0	2.0	2.0
53	1.0	2.5	5.0
54	2.0	2.5	7.5
55	2.0	5.5	15.0
56 – 57	2.5	6.5	10.0
58	5.0	6.5	10.0
59	6.5	6.5	15.0
60	12.0	5.0	20.0
61	20.0	13.0	20.0
62	30.0	15.0	25.0
63	25.0	12.5	25.0
64	22.0	18.0	30.0
65	40.0	15.0	100.0
66 – 67	25.0	20.0	--
68	30.0	25.0	--
69	30.0	20.0	--
70	100.0	100.0	--

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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**Retirement Age for Inactive  
Vested Participants:**

55 for participants hired prior to April 2, 2012. For participants hired April 2, 2012 or later, 60 for Group 1, 55 for Group 2, and 50 for Group 4. (Previously, 65 for Groups 1 and 2 and 55 for Group 4).

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**Unknown Data for Participants:**

Same as those exhibited by participants with similar known characteristics.

**Family Composition:**

75% of participants are assumed to be married. None are assumed to have dependent children. Females are assumed to be three years younger than their spouses.

**Benefit Election:**

All participants are assumed to elect Option A.

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**Net Investment Return:**

7.75% (previously, 7.875%)

**Salary Increases:**

<b>Years of Service</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 4</b>
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9+	4.25%	4.50%	4.75%

#### SECTION 4: Reporting Information for the Barnstable County Retirement System

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Previously, Years of Service	Groups 1 and 2	Group 4
0	7.00%	8.00%
1	6.50%	7.50%
2	6.50%	7.00%
3	6.00%	6.50%
4	6.00%	6.00%
5	5.50%	6.00%
6	5.50%	5.50%
7	5.00%	5.50%
8	5.00%	5.25%
9	4.75%	5.25%
10+	4.75%	5.25%

**Interest on Employee Contributions:** 3.5%

**Administrative Expenses:** \$1,150,000 for calendar 2014, increasing 4.0% per year (previously, \$1,150,000 for calendar 2012, increasing 4.5% per year).

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**Total Service:** Total creditable service reported in the data.

**2013 Salary:** 2013 salaries are equal to salaries provided in the data except for participants missing salary, where salaries were calculated from annualized contributions divided by the contribution rates provided.

**Net 3(8)(c) Liability:** No liability is valued for benefits paid to or received from other municipal retirement systems.

**Actuarial Value of Assets:** A preliminary actuarial value is first determined by taking the actuarial value of assets at the beginning of the year and adding assumed investment earnings (at the assumed actuarial rate of return) and the net new money during the year (contributions less benefit payments and administrative expenses). Twenty percent of the difference between the market value of assets as reported in the System's Annual Statement and the preliminary actuarial value of assets is added to the preliminary actuarial value. In order that the actuarial value not differ too significantly from the market value of

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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assets, the final actuarial value of assets must be within 20% of the market value of assets.

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**Actuarial Cost Method:**

Entry Age Normal Actuarial Cost Method. Entry Age is the attained age of the participant minus total creditable service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal Cost is determined using the plan of benefits applicable to each participant. (Previously, Normal Cost was determined as if the current plan of benefits had always been in effect.)

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**Changes in Assumptions:**

This valuation reflects the following changes in actuarial assumptions:

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The investment return assumption was decreased from 7.875% to 7.75%.
- The assumed rates of salary increases were revised to more accurately reflect recent experience and future expectations.
- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally using Scale AA from 2010.
- The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale AA from 2010.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally using Scale AA from 2010.
- The assumed retirement age for inactive vested participants was changed from age 65 to age 55 for Group 1 and 2 members hired prior to April 2, 2012.

## SECTION 4: Reporting Information for the Barnstable County Retirement System

### EXHIBIT VII

#### Summary of Plan Provisions

This exhibit summarizes the major provisions of Chapter 32 of the Laws of Massachusetts.

**Plan Year:** January 1 through December 31

#### Retirement Benefits

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

Percent	Age Last Birthday at Date of Retirement		
	Group 1	Group 2	Group 4
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45



## SECTION 4: Reporting Information for the Barnstable County Retirement System

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A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on April 2, 2012 or later, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following tables based on the age and years of creditable service of the member at retirement:

**For members with less than 30 years of creditable service:**

Age Last Birthday at Date of Retirement			
Percent	Group 1	Group 2	Group 4
2.50	67 or over	62 or over	57 or over
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

**For members with 30 years of creditable service or greater:**

Age Last Birthday at Date of Retirement			
Percent	Group 1	Group 2	Group 4
2.500	67 or over	62 or over	57 or over
2.375	66	61	56
2.250	65	60	55
2.125	64	59	54
2.000	63	58	53
1.875	62	57	52
1.750	61	56	51
1.625	60	55	50

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

For employees who became members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

For all employees, the maximum annual amount of the retirement allowance is 80 percent of the member's final average salary. Any member who is a veteran also receives an additional yearly retirement allowance of \$15 per year of creditable service, not exceeding \$300. The veteran allowance is paid in addition to the 80 percent maximum.

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### Employee Contributions

<u>Date of Hire</u>	<u>Contribution Rate</u>
Prior to January 1, 1975	5%
January 1, 1975 – December 31, 1983	7%
January 1, 1984 – June 30, 1996	8%
July 1, 1996 onward	9%

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of \$30,000.

Employees hired after 1983 who voluntarily withdraw their contributions with less than 10 ten years of credited service receive 3% interest on their contributions.

Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%.

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### Retirement Benefits (Superannuation)

Members of Group 1, 2 or 4 hired prior to April 2, 2012 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

## **SECTION 4: Reporting Information for the Barnstable County Retirement System**

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Members hired prior to April 2, 2012 who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

Members of Group 1 hired April 2, 2012 or later may retire upon the attainment of age 60. Members of Group 2 or 4 hired April 2, 2012 or later may retire upon the attainment of age 55. Members of Group 4 may retire upon attainment of age 50 with ten years of creditable service.

Members hired April 2, 2012 or later who terminate before age 55 (60 for members of Group 1) with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (60 for members of Group 1) provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System.

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### **Ordinary Disability Benefits**

A member who is unable to perform his or her job due to a non-occupational disability will receive a retirement allowance if he or she has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55 (age 60 for Group 1 members hired on or after April 2, 2012), based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his or her own contributions.

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### **Accidental Disability Benefit**

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his or her own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988.

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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### Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of \$500 (previously, \$250) per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay, in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death.

Upon the death of a job-connected disability retiree who retired prior to November 7, 1996 and could not elect an Option C benefit, a surviving spouse will receive an allowance of \$12,000 per year (previously, \$9,000) if the member dies for a reason unrelated to cause of disability.

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### "Heart And Lung Law" And Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman, permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

## SECTION 4: Reporting Information for the Barnstable County Retirement System

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### Options

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death any contributions not expended for annuity payments will be refunded to the beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

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### Post-Retirement Benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first \$15,000 (previously, \$14,000) of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998 are reimbursed by the Commonwealth and not reflected in this report.

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### Changes in Plan Provisions

As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$15,000 as of July 1, 2013.

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

As permitted by Section 63 of Chapter 139 of the Acts of 2012, the Board has increased the Section 101 annual allowance from \$9,000 to \$12,000.

As permitted by Section 29 of Chapter 176 of the Acts of 2011, the Board has increased the Section 12 monthly allowance from \$250 to \$500.

## SECTION 5: GASB Information for the Barnstable County Retirement System

### EXHIBIT 1

#### Net Pension Liability

The components of the net pension liability of the Barnstable County Retirement System at December 31, 2013 were as follows:

Total pension liability	\$1,353,810,101
Plan fiduciary net position	793,984,292
System's net pension liability	559,825,809
Plan fiduciary net position as a percentage of the total pension liability	58.65%

*Actuarial assumptions.* The total pension liability was determined by an actuarial valuation as of December 31, 2013, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	4.00%
Salary increases	Varies by length of service with ultimate rates of 4.25% for Group 1, 4.50% for Group 2 and 4.75% for Group 4
Investment rate of return	7.75%, net of pension plan investment expense, including inflation
Cost of Living Adjustment	3% of first \$15,000
Pre-Retirement:	RP-2000 Employee Mortality Table projected generationally with Scale AA from 2010
Healthy Retiree:	RP-2000 Healthy Annuitant Mortality Table projected generationally with Scale AA from 2010
Disabled Retiree:	RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally with Scale AA from 2010

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2013 are summarized in the following table:

## SECTION 5: GASB Information for the Barnstable County Retirement System

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	6.60%
International developed markets equity	7.10
International emerging markets equity	9.40
Core fixed income	2.20
High-yield fixed income	4.70
Real estate	4.40
Commodities	4.40
Hedge fund, GTAA, Risk parity	3.90
Private equity	11.70

*Discount rate:* The discount rate used to measure the total pension liability was 7.75%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability, calculated using the discount rate of 7.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate:

	1% Decrease (6.75%)	Current Discount (7.75%)	1% Increase (8.75%)
Barnstable County Retirement System's net pension liability as of December 31, 2013	\$717,341,909	\$559,825,809	\$426,353,194

**SECTION 5: GASB Information for the Barnstable County Retirement System****EXHIBIT 2****Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions****A. Pension expense for the year ended June 30, 2015**

Service cost	\$35,328,892
Interest	--
Recognized portion of current-period difference between expected and actual experience	--
Contributions – employee	--
Projected earnings on pension plan investments	--
Recognized portion of current-period difference between projected and actual earnings on pension plan investments	--
Recognition of deferred outflows of resources	--
Recognition of deferred inflows of resources	--
Pension expense for fiscal year ended June 30, 2015	To be determined

**B. Deferred outflows/inflows of resources related to pensions**

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	--	--
Changes of assumptions	--	--
Changes of benefit terms	--	--
Net difference between projected and actual earnings on pension plan investments	--	--
Total	To be determined	To be determined

**C. Projected recognition of deferred outflows/(inflows)**

	Year Ended June 30,	Recognition
	2016	--
	2017	--
	2018	--
	2019	--
	2020	--
	Thereafter	--

*Note: Entry Age Normal liabilities calculated using ages and service amounts as of January 1, 2014 are used to measure the pension expense for fiscal year ended June 30, 2015.*



## SECTION 5: GASB Information for the Barnstable County Retirement System

### EXHIBIT 3

#### Schedule of Changes in the Net Pension Liability – Last Ten Years

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
<b>Total pension liability</b>										
Service cost	\$35,382,892									
Interest	--									
Differences between expected and actual experience	--									
Changes of assumptions	--									
Changes of benefit terms	--									
Benefit payments, including refunds of employee contributions	--									
<b>Net change in total pension liability</b>	TDB									
<b>Total pension liability - beginning</b>	\$1,353,810,101									
<b>Total pension liability - ending (a)</b>	<u>\$TBD</u>									
<b>Plan fiduciary net position</b>										
Contributions - employer	--									
Contributions - employee	--									
Net investment income	--									
Benefit payments, including refunds of employee contributions	--									
Other	--									
<b>Net change in fiduciary net position</b>	TBD									
<b>Plan fiduciary net position - beginning</b>	\$793,984,292									
<b>Plan fiduciary net position - ending (b)</b>	TBD									
<b>Net pension liability – ending: (a)-(b)</b>	<u>TDB</u>									
<b>Plan's fiduciary net position as a percentage of the total pension liability</b>	TBD									
<b>Covered-employee payroll</b>	\$253,920,106*									
<b>Net pension liability as a percentage of covered-employee payroll</b>	TBD									

\*Covered-employee payroll as reported in the January 1, 2014 funding valuation report

## SECTION 5: GASB Information for the Barnstable County Retirement System

### EXHIBIT 4

#### Schedule of Contributions – Last Ten Years

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Actuarially determined contribution*	\$52,473,575									
Contributions in relation to the actuarially determined contribution	TBD									
Contribution deficiency (excess)	TBD									
Covered-employee payroll	\$253,920,106									
Contributions as a percentage of covered-employee payroll	20.26%									

\* Based on the results of the January 1, 2012 actuarial valuation (including assumptions and methods) which determined budgeted appropriation for fiscal 2015.

## SECTION 5: GASB Information for the Barnstable County Retirement System

### EXHIBIT 5

#### Notes to Required Supplementary Information

<b>Valuation date</b>	Actuarial determined contributions are calculated as of January 1 two years prior to the end of the employer's fiscal year in which contributions are reported
<b>Actuarial cost method</b>	Entry Age Normal Cost Method
<b>Amortization method</b>	Payments increase at 4.0%, except for 2010 Early Retirement Incentive, which is a level payment.
<b>Remaining amortization period</b>	22 years from July 1, 2014 for 2002 and 2003 Early Retirement Incentives, retiree sheriffs liability and remaining unfunded liability, and 8 years from July 1, 2014 for 2010 Early Retirement Incentive
<b>Asset valuation method</b>	Sum of actuarial value at beginning of the year, contributions and investment earnings based on the actuarial interest assumption less benefit payments and operating expenses plus 20% of the market value at the end of the year in excess of that sum, plus additional adjustment toward market value as necessary so that final actuarial value is within 20% of market value.
<b>Actuarial assumptions:</b>	
Investment rate of return	7.75% (previously, 7.875%)
Discount rate	7.75% (previously, 7.875%)
Inflation rate	4.0% (previously, 4.5%)
Projected salary increases	Varies by length of service with ultimate rates of 4.25% for Group 1, 4.5% for Group 2 and 4.75% for Group 4. (previously, varied by length of service with ultimate rates of 4.75% for Groups 1 and 2 and 5.25% for Group 4)
Cost of living adjustments	3% of first \$15,000
<b>Plan membership:</b>	
Retired participants and beneficiaries receiving benefits	2,729
Inactive participants entitled to a return of their employee contributions	513
Inactive participants with a vested right to a deferred or immediate benefit	138
Active participants	<u>4,696</u>
Total	8,076

## SECTION 5: GASB Information for the Barnstable County Retirement System

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### Changes in Assumptions:

The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.

The investment return assumption was decreased from 7.875% to 7.75%.

The assumed rates of salary increases were revised to more accurately reflect recent experience and future expectations.

The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected generationally using Scale AA from 2010.

The post-retirement mortality assumption for non-disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale AA from 2010.

The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table set forward three years for males only projected generationally using Scale AA from 2010.

The assumed retirement age for inactive vested participants was changed from age 65 to age 55 for Group 1 and 2 members hired prior to April 2, 2012.

### Changes in Plan Provisions:

As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$15,000 as of July 1, 2013.

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

As permitted by Section 63 of Chapter 139 of the Acts of 2012, the Board has increased the Section 101 annual allowance from \$9,000 to \$12,000.

As permitted by Section 29 of Chapter 176 of the Acts of 2011, the Board has increased the Section 12 monthly allowance from \$250 to \$500.

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